8. WATER ELEMENT

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8. WATER ELEMENT

BACKGROUND AND PURPOSE

The main purpose of the Water Element is to consolidate information and polices related to the conservation and management of water resources, riparian corridors,[1] and watershed lands. The Water Element also defines the water and wastewater capacity, and stormwater facilities needed to service the community at build out.

Seasonal stream at the Alviso Adobe

A water element is an optional general plan element. This Water Element addresses all water resources, including watershed lands, wildlife habitat, ground and surface water resources, and stormwater runoff. The Water Element also discusses water-related public facilities including water wells, reservoirs, sewer and waterlines, treatment plants, stormwater control, and drainage, all of which are parts of the infrastructure that support development. By including this Water Element, the City of Pleasanton is highlighting the importance of water to the community's future.

California Government Code Section 65302 requires a land use element that includes the location and extent of various land uses, including public liquid waste-disposal facilities, and a conservation element that includes water and its hydraulic force, rivers and other waters. Section 65302 also states that the conservation element may cover prevention and control of streams and other waters, protection of watersheds, and flood control. Note, however, that *Government Code* Section 65301(a) allows a legislative body to adopt a general plan in any format deemed appropriate or convenient. Pleasanton has chosen to include the distribution, location, and extent of water-related public facilities and water resources in this Water Element.

SUSTAINABILITY

As stated in the General Plan Vision, the City of Pleasanton embraces the concept of sustainable development. A sustainable city strives to draw from the environment only those resources that are necessary and that can be used or recycled perpetually, or returned to the environment in a form that nature can use to generate more resources. Directly relating the concept of sustainability to water includes restoring and retaining the health of water courses and riparian corridors, conserving water supplies, storing surface waters, recharging the groundwater basin, and retaining water quality at healthy levels. This Element addresses the concept of sustainability through its goals, policies, and programs.

[1] Riparian means located along or near a watercourse or stream.

WATER RESOURCES [2]

Watershed Lands

A watershed is a basic geographic unit defined by where water sheds or drains. A ridge or the highest point in a geographic area usually divides watersheds such that water drains down into different creek or river systems. Streams, streambeds, and flood-control channels provide linear areas that offer opportunities for incorporating trails and other recreational uses. Surface waters, wetlands, and riparian corridors provide habitat for wildlife. The City strives to retain these features in their natural condition.

Alameda Creek Watershed

Pleasanton lies within the Alameda Creek watershed, a drainage basin encompassing about 675 square miles between Mount Hamilton and Mount Diablo. See Figure 8-1. Although all of Pleasanton is located within the Alameda Creek watershed, each creek or reservoir has its own smaller watershed that ultimately feeds into Alameda Creek. Winding through the Alameda Creek watershed is an intricate system of streams and tributaries. Alameda Creek, the principal water course, flows northwest from its origin on Mount Hamilton until it meets the Arroyo de la Laguna near Sunol and then runs west through Niles Canyon to San Francisco Bay. The Arroyo de la Laguna collects the surface water runoff from the Tri-Valley and carries it south to Alameda Creek. The General Plan Map designates these creeks along with other areas as Public Health and Safety with a Wildlands Overlay. (See Figure 8-2, Existing Surface Water Resources.)

The Alameda Creek Watershed provides habitat for a variety of wildlife. As addressed under Plant Life in the Conservation and Open Space Element, valuable native plant habitats in streambeds and channels throughout the watershed support a diversity of wildlife species. Arroyo del Valle, Arroyo Mocho, Arroyo de la Laguna, and other riparian corridors provide food, water, migration and dispersal corridors, breeding sites, and thermal cover – heat protection – for wildlife.

Arroyo de la Laguna

Although development has reduced much of Pleasanton's natural habitat, streams and streambeds continue to provide natural habitat communities, including freshwater marsh, central coast riparian scrub, riparian woodland, alkali meadow, and valley sink scrub. A special status wildlife species found in Planning Area streams is the California red-legged frog. (See Animal Life in the Conservation and Open Space Element for additional discussion of wildlife.)

Undeveloped areas of the watershed are designated as open-space lands. These include Parks and Recreation, Water Management and Recreation, Agriculture and Grazing, Public Health and Safety, and Wildlands Overlay. (See also Open Space Lands in the Conservation and Open Space Element along with Figure 7-4, Open Space Lands.) The Water Management and Recreation designation describes land specifically dedicated to water resources; however, note that all open space lands contribute to water recharge and watershed health.

[2] Zone 7 Water Agency, *Stream Management Master Plan,* March 2006.

2005 PLEASANTON PLAN 2025

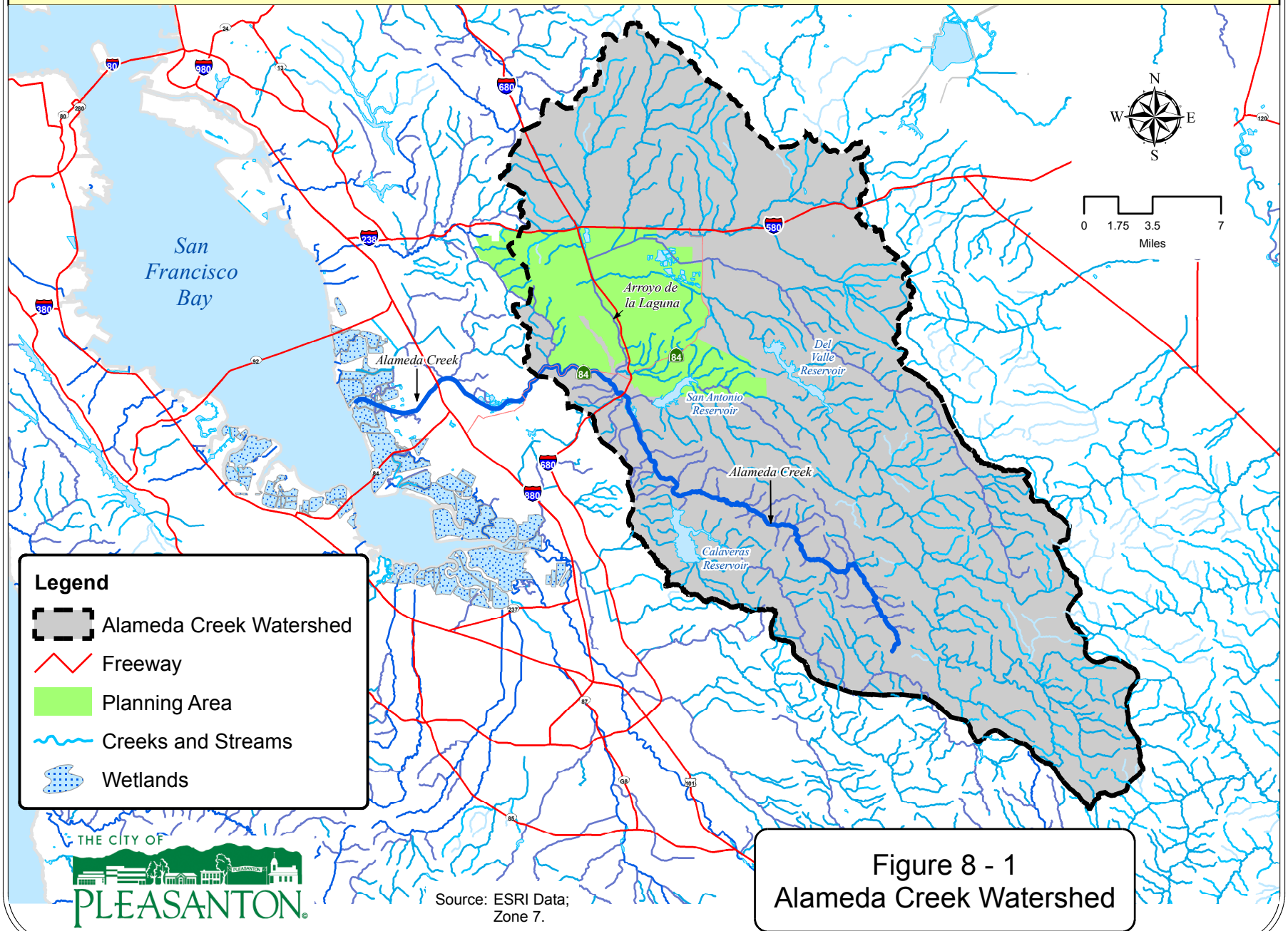
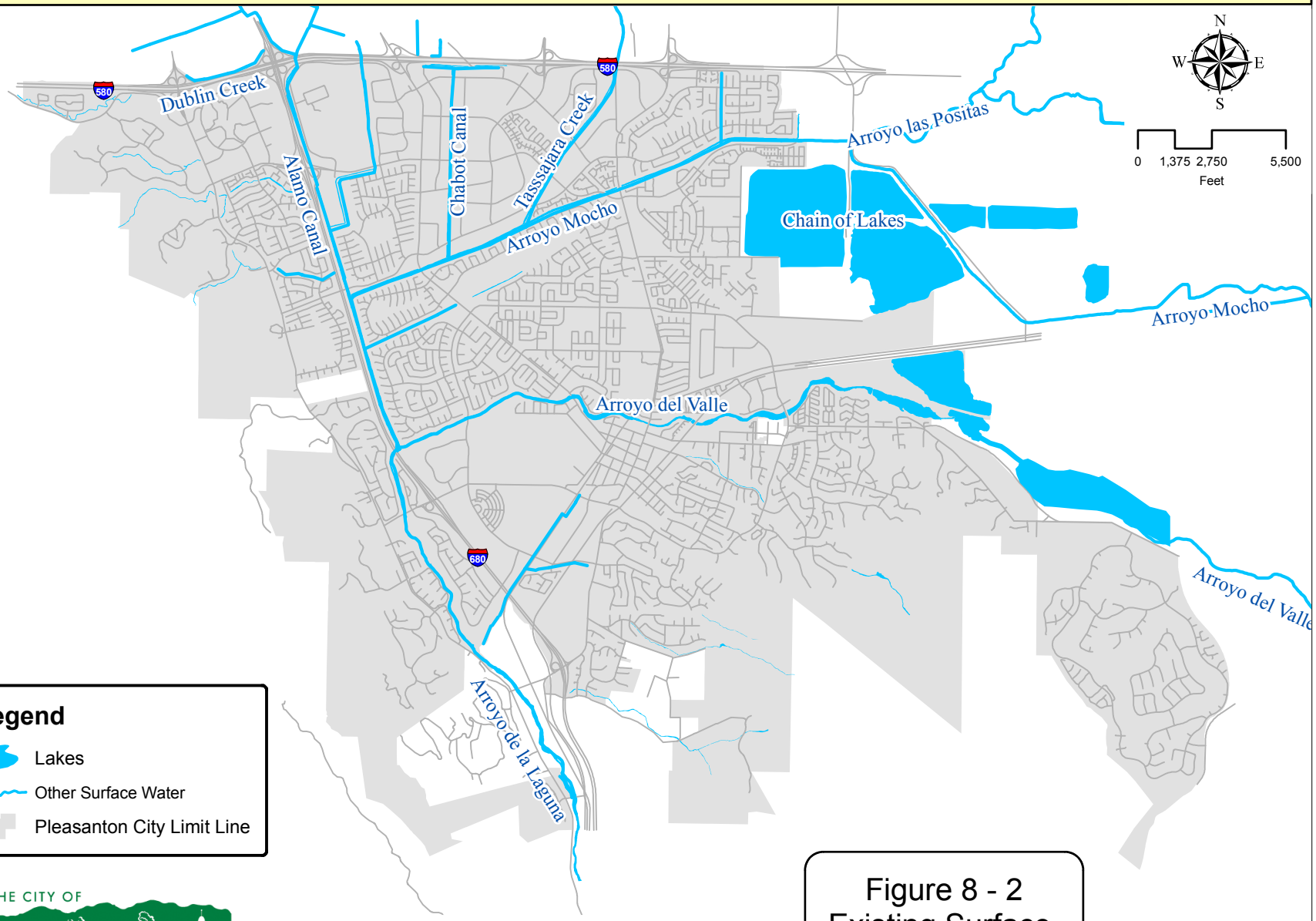


Figure 8 - 1
Alameda Creek Watershed

2005 PLEASANTON PLAN 2025



THE CITY OF PLEASANTON

Source: Zone 7 Water Agency, Stream Management Master Plan, March 2006

Figure 8 - 2
Existing Surface Water Resources

Although all creeks feeding the Arroyo de la Laguna are naturally seasonal, Zone 7 of the Alameda County Flood Control and Water Conservation District releases both stored water from the Del Valle Reservoir and imported water from the South Bay Aqueduct into these creeks. These controlled water releases recharge the local groundwater basin underlying the Planning Area.

Groundwater recharge is a vital component of natural resource water supply production. The Arroyo de la Laguna, Arroyo del Valle, Arroyo Mocho, and part of the Chain of Lakes act as groundwater recharge areas. The Land Use Map designates the Chain of Lakes as Water Management and Recreation, partially due to groundwater recharge functions. See additional discussion in the Conservation and Open Space Element under Water Management and Recreation.

Zone 7 Water Agency

Lake I water recharge area, Chain of Lakes

The groundwater basin includes several aquifers consisting of water-bearing gravel layers separated by impervious clay layers. Directly under flat portions of the Planning Area sits the greatest amount of usable groundwater in the main water basin. Figure 8-3 shows the location of water resources in the Planning Area, including the main groundwater basin as well as surface water resources.

Shadow Cliffs, the Chain of Lakes, and the San Antonio Reservoir, provide additional surface water resources. Shadow Cliffs Regional Recreation Area, which is open to the public for active and passive recreation, incorporates a former gravel quarry as a lake.[3] The Chain of Lakes is a series of nine existing and future reclaimed gravel-mining pits. The City will coordinate recreational opportunities with Zone 7 as it prepares a future Chain of Lakes Master Plan. These lakes have the potential to provide storage for both water and stormwater. In addition, the Chain of Lakes provides surface water resources that could be used for passive – and, in the future, possibly limited active – recreation, as well as waterfowl habitat.

See Water Systems section, below, for discussion of water supply, storage, and distribution.

San Francisco-Owned Watershed Lands

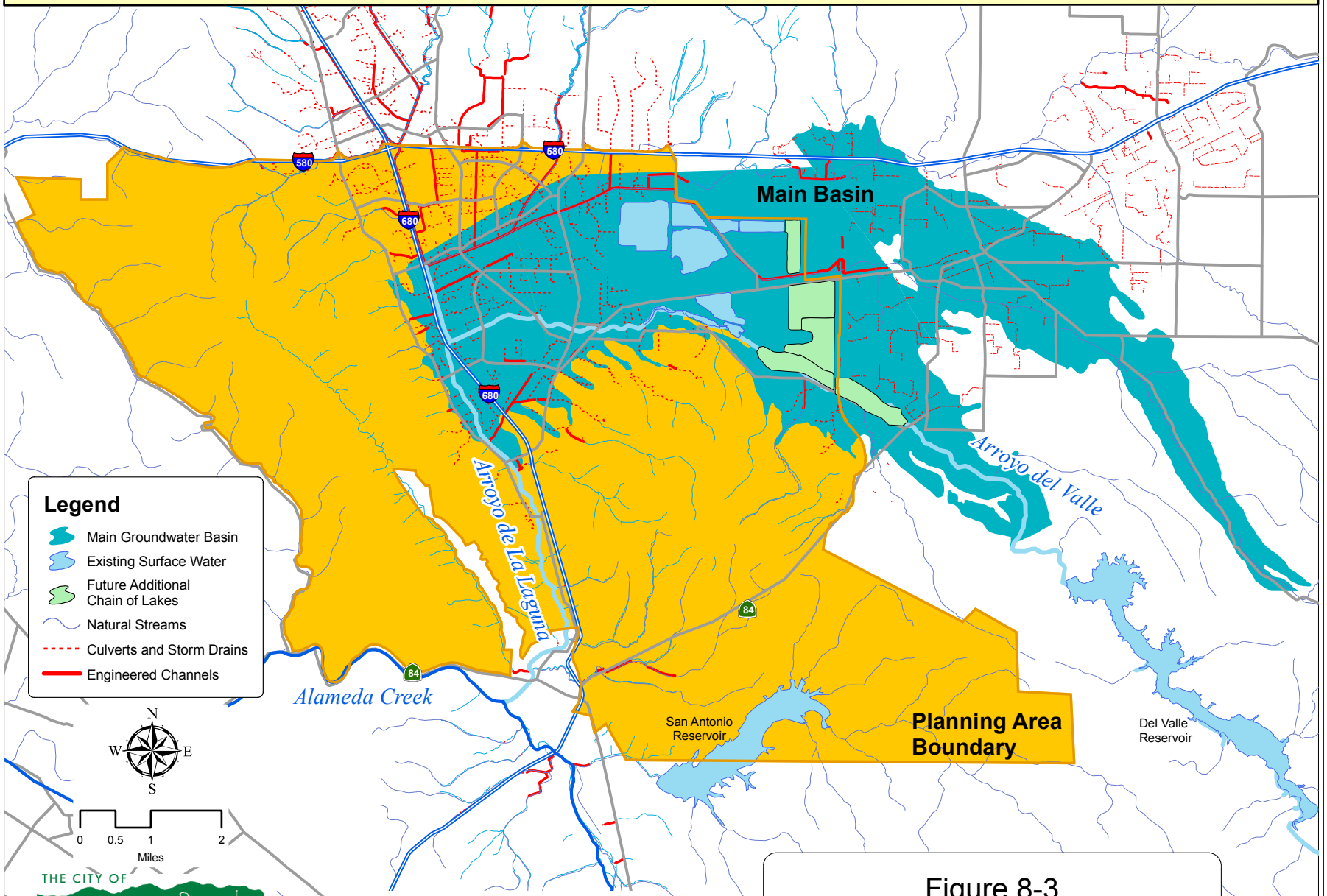
A portion of the Alameda Creek watershed, owned and operated by City and County of San Francisco, drains into the San Antonio Reservoir, which is partially located in the Planning Area. The reservoir provides water to the City and County of San Francisco but is not open to the public. The main streams on this land in or near the Planning Area include San Antonio, Indian, and Alameda Creeks. Figure 8-4 shows San Francisco watershed lands in and near the Planning Area.

The San Francisco Public Utilities Commission (PUC) leases out a portion of its Alameda Creek Watershed lands to a variety of uses

[3] Active recreation refers to physical activities including, but not limited to, sports, games, dancing, exercising, and fishing.

Outdoor passive recreation refers to activities compatible with preserving natural and cultural resources, such as wildlife habitat, arroyos, floodplains, and historic resources. Passive recreation includes – but is not limited to – the following activities when they are harmonious with the environment: walking, bicycling, horseback riding, nature and cultural resource study, photography, and picnicking.

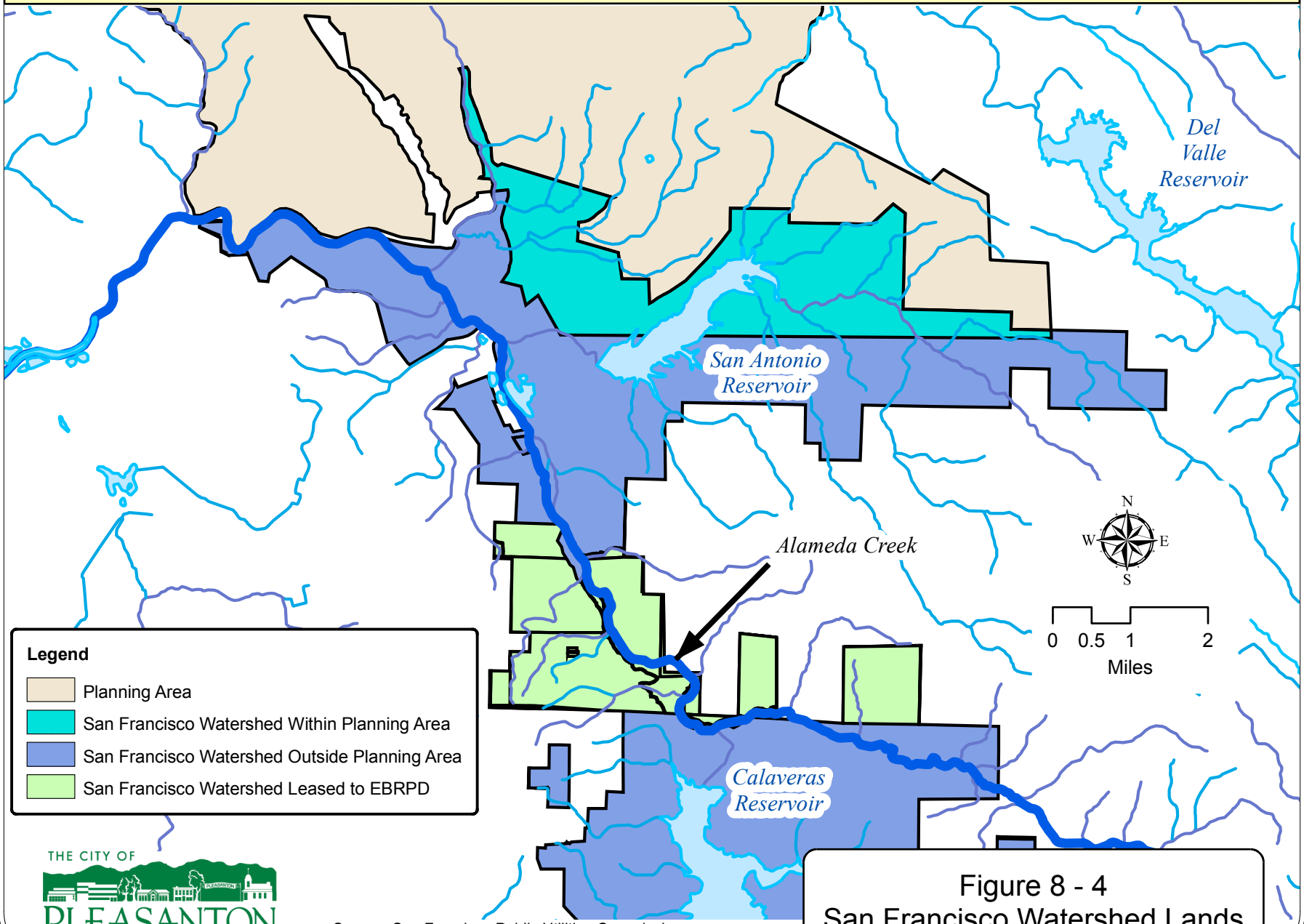
2005 PLEASANTON PLAN 2025



Source: Zone 7 Water Agency, 2007; City of Pleasanton, Community Development Department, 2008

Figure 8-3
Planning Area Water Resources

2005 PLEASANTON PLAN 2025



THE CITY OF PLEASANTON

Source: San Francisco Public Utilities Commission
Natural Resources Division, 2007.

Figure 8 - 4
San Francisco Watershed Lands

including grazing, plant nurseries, and quarry operations. Several utility companies have easements for routing of public utilities such as gas pipelines, electrical transmission lines, and water aqueducts. The East Bay Regional Park District leases a portion of San Francisco's watershed lands as part of the Sunol-Ohlone Regional Wilderness. The portion operated by the Park District includes hiking, equestrian, and bicycle trails. San Francisco-owned watershed lands not leased to other entities are not open to the public due to fire risk and potential degradation of water quality and natural resources. The San Francisco PUC, however, allows access to some internal fire roads by permit for research or educational purposes.

Water Quality

Both Zone 7 and the City of Pleasanton operate extensive water-quality monitoring programs that they have continually updated and refined over the last decade. Neither agency has detected any significant levels of volatile organic compounds or contaminants in the water supply. In addition, Pleasanton's water quality has complied with all federal and State drinking water-quality standards.

Within the Planning Area, the Regional Water Quality Control Board has characterized the Arroyo de la Laguna, Arroyo las Positas, Arroyo del Valle, Arroyo Mocho, and Alameda Creek as impaired by diazinon.[4] Diazinon is a pesticide used on a variety of agricultural crops and formerly used on residential gardens and lawns. As of December 31, 2004, the EPA no longer permits its sale for non-agricultural uses. The chemical can only be used by licensed applicators under strict regulations regarding its application and location of use (using only the chemicals remaining on hand at the end of 2004). Due to the ban, the diazinon levels in the creeks entering the Bay have diminished.

Diazinon is highly toxic to birds, mammal, honeybees and other beneficial insects, freshwater fish, and invertebrates. Diazinon is not dangerous to people due to contact exposure, but can be dangerous to people who swallow concentrated or large quantities of it. It affects plasma, red blood cells, and brains in humans, especially children. In addition, diazinon is one of the top causes of bird-kill incidents. [5]

Diazinon is a non-point pollutant within the Planning Area. Zone 7 is the agency responsible for testing the arroyos for diazinon and cleaning up this pollutant, when found. Continued monitoring for diazinon and other pollutants of concern should be performed to help define the non-source pollutant problems within the Planning Area. Water quality protection from diazinon can be achieved through source control and through increasing public education, particularly for agricultural users.

The Dublin-San Ramon Services District currently treats and monitors the City's sewage effluent by contract. The sewage treatment plant produces secondary effluent which is pumped to San Francisco Bay, tertiary effluent which is used primarily for landscape watering in commercial areas in Dublin, and sludge which is decomposed and then buried nearby in the drying beds north of Stoneridge Drive. The District monitors secondary effluent on a daily basis and monitors the sewage transport system for pH levels (a measure of acidity or alkalinity) and hydrogen sulfide. At its sewage ponds site, the District operates numerous test wells that have shown no toxic material intrusion on the soil content. See Wastewater, below, for additional discussion of wastewater treatment.

[4] Impaired surface waters are those known to not meet applicable *Clean Water Act* water quality standards or that require implementation of control programs to maintain compliance with applicable water quality standards.

[5] US Environmental Protection Agency, "Pesticides: Organophosphates," March 20, 2006, http://www.epa.gov/pesticides/op/diazinon/summary.htm.

WATER SYSTEMS

The City of Pleasanton is a water retailer, providing water primarily to Pleasanton homes and businesses but also to several adjacent, unincorporated areas (Kilkare Woods, Remen tract, portions of unincorporated Foothill Road, and other isolated service areas). Pleasanton does not serve the Castlewood area residences or golf courses; the City and County of San Francisco's Water Department serves these residences and other Castlewood uses from pumped groundwater-basin waters that are accounted for in Zone 7's groundwater use.

The City of Pleasanton receives the majority of its water from the Zone 7 Water Agency (the Tri-Valley's water wholesaler) through seven permanent turnouts from the Zone 7 system and from its own wells. The City owns and operates three active groundwater wells and a water distribution, pumping, and storage system divided into a number of water pressure zones.

The adequacy of Pleasanton's water system depends on the water supply available and the pumping, storage, and distribution systems capacity to deliver water on demand. Water supplies must be capable of meeting maximum-day demands. Storage must be capable of meeting peak-hour demand, fire-flow volumes, and an emergency reserve. The distribution system must be able to provide required flows at adequate pressures throughout the system.

Figure 8-5 shows the groundwater basin, water-supply wells, and surface water treatment locations.

Water Supply [6]

Zone 7 of the Alameda County Flood Control and Water Conservation District (Zone 7 Water Agency) provides wholesale water to the Tri-Valley area and also regulates withdrawal and recharge of the underlying groundwater basin. Zone 7 currently has three sources of water: State Water Project water from the South Bay Aqueduct, surface runoff collected in the Del Valle Reservoir, and local groundwater. In addition to water stored in the local groundwater basin, Zone 7 has acquired additional out-of-basin groundwater storage to help supply its service area during droughts.

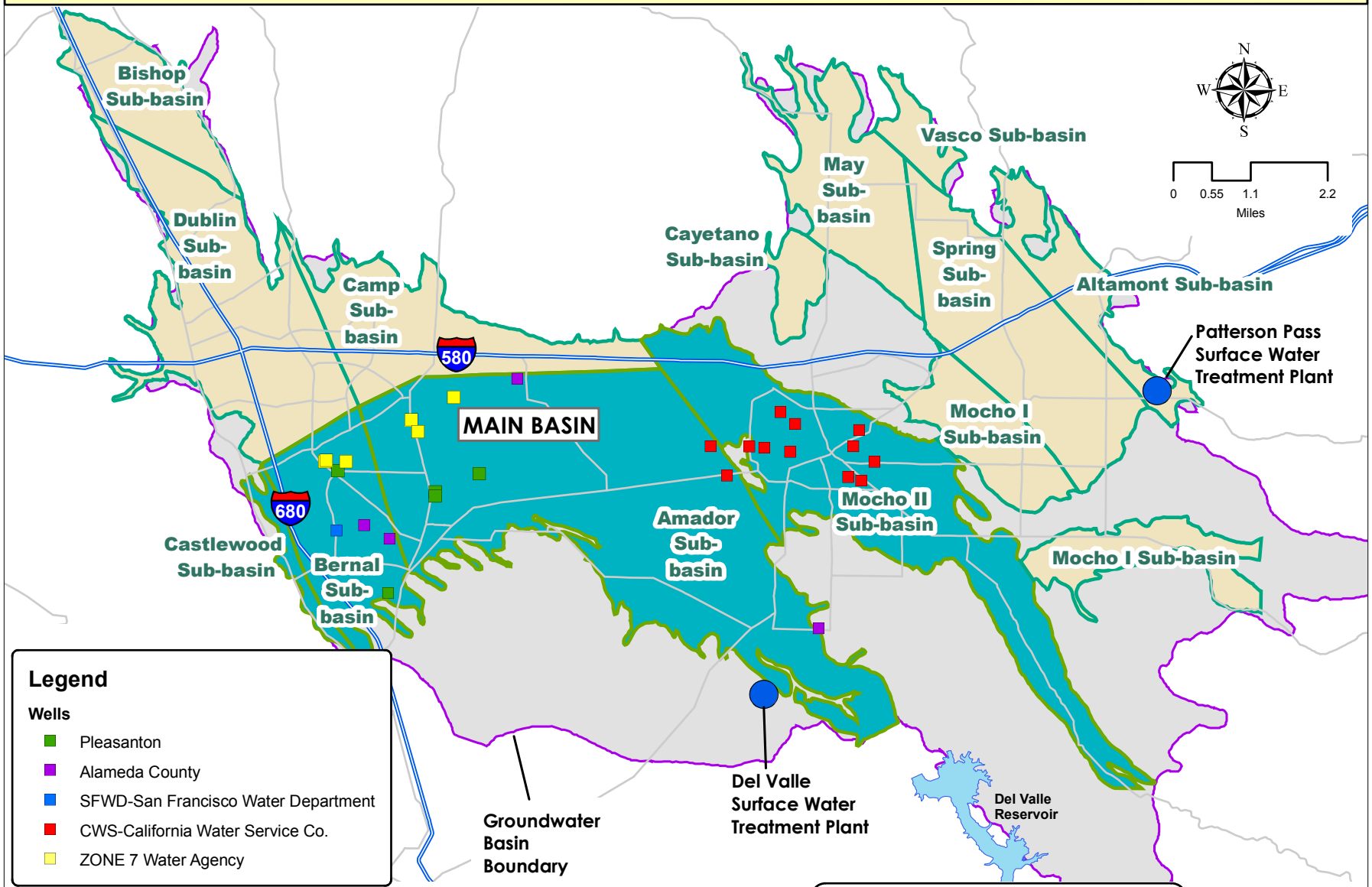
The State pumps State Water Project water from the Sacramento-San Joaquin Delta via the California Aqueduct and conveys it to the Valley via the South Bay Aqueduct. Zone 7 then treats this imported water at its Patterson Pass and Del Valle Water Treatment Plants in Livermore, and then sends it to Pleasanton via the Zone 7 Cross Valley and Vineyard Pipelines. Zone 7 also stores water from the State Water Project and from local runoff in the Del Valle Reservoir. Zone 7 uses this water to replenish groundwater supplies through release into the Arroyo del Valle and Arroyo Mocho and also as a secondary local supply to its two water treatment plants. Several sub-basins in the Tri-Valley area contain groundwater, the most important of which are located in the west-central area of the Valley where the major Zone 7 and City wells are located.

Zone 7 distributes its water supplies to cities, water retailers, and unincorporated areas – including to the cities of Pleasanton and Livermore, the Dublin-San Ramon Services District, and the California Water Service Company – based on individual water delivery schedules. Acting as a water wholesaler, it sells water to Pleasanton, which as a retailer

Zone 7 Water Agency

[6] Camp Dresser & McKee, Inc., for the City of Pleasanton, *Water Distribution System Master Plan Update,* November 2004.

2005 PLEASANTON PLAN 2025



THE CITY OF PLEASANTON

Source: Zone 7 Water Agency

Figure 8 - 5
Groundwater Basin, Wells, and Surface Water Treatment

operates and maintains the water pumping, distribution, and storage system to deliver this water to homes and businesses. In a typical year, Zone 7 provides Pleasanton with approximately 75-80 percent of its water. The remainder is pumped through City-owned wells in accordance with a pumping schedule approved by Zone 7. The groundwater, from City- and Zone 7- owned wells, is disinfected (using chloramines – a combination of chlorine and ammonia) prior to being pumped into the City's water system generally during the summer months to meet peak-usage periods. Pleasanton also fluoridates all water supplied to its customers at all times of the year.

Pleasanton's annual groundwater entitlement is 3,500 acre-feet. This amount is fixed by contract with Zone 7, which acts as the regional groundwater basin manager for the Tri-Valley area. The entitlement is subject to negotiation when the City's contract with Zone 7 is renewed, although the City does not anticipate that future-pumping limits will change significantly. Thus, as the City grows, it will rely more on Zone 7 for the bulk of its water supply. Table 8-1 summarizes Pleasanton's existing and projected annual water demand, which is projected to increase about 34 percent at buildout.

Zone 7 projects that it can supply sufficient water to meet the City's future water needs, assuming that the State Department of Water Resources supplies approximately 75 percent of Zone 7's contractual allocation and that other planned and contracted water sources supplement this supply. These additional sources include more imported surface water, water transfers, out-of-basin groundwater storage, water conservation, water recycling, and enhanced conjunctive use of the groundwater basin. Zone 7 has purchased additional groundwater storage to enhance the reliability of water supply during drought periods.

In order to meet future needs, based on build out of its customers' general plans, Zone 7 plans to spend over $300 million funded from

TABLE 8-1:
PLEASANTON'S ANNUAL WATER DEMAND, 2005 - 2025

Land Use	Units	2005 [a]	2025
Single-Family Residential [b]	Gallons/day	8,260,314	9,784,064
Multi-Family Residential [b]	Gallons/day	741,385	1,091,485
Commercial & Institutional [c]	Gallons/day	1,556,959	2,586,888
Industrial [c]	Gallons/day	59,461	266,332
Landscape Irrigation [d]	Gallons/day	3,338,504	5,548,594
Parks [e]	Gallons/day	749,527	1,036,370
TOTALS:	Gallons/day	**14,706,150**	**20,313,733**
	100 cu ft/year [f]	**7,176,129**	**9,912,450**

Notes:

[a] 2005 water usage in Pleasanton is based on actual consumption.

[b] Currently 35 percent of multi-family units are condominiums and townhomes that are considered as single-family units for water consumption. The City estimates that future single-family residential units will use on average about 450 gallons per day (gpd) and multi-family will use 300 gpd. The Land Use Element assumes 2,022 new single-family and 1,795 new multi-family dwellings at buildout. For water consumption purposes, using the current ratio of condominium and townhouses to other multi-family units in the future, there will be 2,650 single-family and 1,167 multi-family units.

[c] Commercial/Institutional includes retail, office, government, medical, schools, and other institutional uses with a water demand factor of 0.074 gallons a day per square feet of development. Industrial development uses the same factor.

[d] Landscape irrigation is for commercial/institutional and industrial uses only. The two vineyards near Ruby Hill and other agricultural uses in the southeast hills obtain water directly from Zone 7. Future use assumes 34 percent growth.

[e] East Bay Regional Parks consumed 2,519 units of water in 2005. This is not estimated to change in 2025. Note that water is totaled for City Parks by fiscal year (July 1, 2004 to June 30, 2005) rather than calendar year. Buildout assumes 131 acres of new parks, not including open space at Alviso Adobe.

[f] cu ft = cubic feet, 100 cubic feet = 748 gallons

Sources: City of Pleasanton Utility Billing Division, 2006; Planning & Community Development Dept. 2008; CDM, *Water Distribution System Master Plan Update,* Nov. 2004.

conveyance, storage, and groundwater recharge and extraction facilities. In addition, over the next 20 years Zone 7 plans to spend over $200 million to replace or improve its existing system.

Zone 7 has a current sustainable water supply of 86,100 acre-feet per year (although this amount has been temporarily reduced to 81,200 acre-feet per year due to Delta environmental issues) and this amount, in the long-term, is anticipated to continue until after 2025. Zone 7 predicts a long-term demand of 82,313 acre feet in the year 2025.[7] Thus, in the long term, Zone 7 has sufficient water to maintain full water deliveries through General Plan build-out of its customers – including Pleasanton. To replace and maintain water supply sustainability back up to the 86,100 acre-feet per year amount, Zone 7 is participating in a number of Delta water quality improvement projects and is currently exploring other sources of imported surface water and out-of-basin groundwater storage projects.

Zone 7 Water Agency water supply

The local groundwater basin that Zone 7 manages currently holds approximately 202,000 acre-feet. The groundwater basin is considered full at about 240,000 acre-feet, and Zone 7 estimates that approximately half of this amount is available by well pumping. Zone 7 plans to install a well network capable of producing 75 percent of its maximum day municipal demand. With this capacity, Zone 7 could supply its users with an acceptable volume of water during droughts or emergencies (such as when any major facilities – the State Water Project, the South Bay Aqueduct, etc. – are out of service).

Zone 7 has recently installed two new wells capable of producing 6 million gallons per day (mgd) each of water (Mocho Wells No. 3 and No. 4). With these wells in place, Zone 7 can pump enough water from the groundwater table to meet approximately 60 percent of current maximum day demand. It has also begun drilling two new quarry-area wells to increase groundwater pumping closer to the 75 percent current water demand level. As growth continues in its service area, Zone 7 will continue drilling new groundwater wells to increase its pumping capacity to the 75 percent-demand level.

Besides the quantity of water supply, Pleasanton residents are concerned about their water quality. Some citizens complain of earthy-musty taste and odor (caused by decomposing algae in surface water sources), water hardness (caused by minerals such as calcium and magnesium in the groundwater basin), and the taste of chlorine in the water.

Although the City and Zone 7's water are both in compliance with all State and federal water-quality standards, some people consider the local groundwater to have lower quality water than surface-water

[7] Zone 7 Alameda County Flood Control and Water Conservation District, "Annual Review of the Sustainable Water Supply," May 19, 2004.

resources. This is because local groundwater contains total dissolved solids averaging from 400 to 550 milligrams per liter (mg/l) and has higher amounts of naturally occurring minerals such as calcium and magnesium than water from other sources. Although these minerals are harmless at the levels present in the groundwater, after the winter months the summertime well water sometimes has a noticeable change in taste, odor, and/or washing characteristics. See Water Supply, below, in the Water Systems section for additional discussion of water odor, taste, and hardness.

In 2003, Zone 7 Water Agency established a Water Quality Management Program to help define the issues and causes of taste, odor, and hardness, and to identify methods to meet anticipated future water quality standards.[8] Currently, Zone 7 has two projects that are being constructed or are being implemented in the short-term (next two years) to improve water quality (i.e., taste, odor, and hardness). The first is the Mocho Wellfield Demineralization Project (which will reduce the hardness of the local groundwater delivered by Zone 7). The second is the temporary introduction of powdered activated carbon at its Del Valle and Patterson Pass Water Treatment Plants.

Zone 7 currently has water treatment plants at Del Valle and Patterson Pass for processing surface water before its distribution. (See Figure 8-5, above, for the location of these plants.) For a longer term improvement to delivered water quality (expected in the year 2011), Zone 7 is in final design for its newest and third surface water treatment plant, the Altamont Water Treatment Plant. This plant, when operational, should further improve the quality of delivered water to Pleasanton.

[8] Zone 7 prepared a biannual Water Quality Management Program Report Card and Status Update, 2003-2004, to summarize data and update the Water Quality Management Program.

Water Storage[9]

Although Zone 7 has sufficient water supply, it needs additional water storage capacity in the future. Zone 7 projects that – without utilizing reserve groundwater basin storage below historic lows – it has sufficient water storage to maintain sustainable water supply through 2013. Zone 7 arrived at this date using growth projections from Zone 7's retailers from the late 1990s. Current growth projections are less than those in the late 1990s. Also, Zone 7 has acquired more drought-related groundwater storage and is in the process of acquiring more drought-related water supplies than planned for in the late 1990s. As a result, this 2013 date is a conservative estimate of the sustainability of current Zone 7 supplies in relationship to projected demand.

In the short-term, Zone 7 can use both local and out-of-basin groundwater storage projects to offset any demand deficits through the use of these groundwater storage assets.

Water storage reservoirs are used to allow 24-hour delivery of the City's water supply at a relatively constant rate, to accommodate hourly fluctuations in demand, and to provide the required fire flows and emergency reserves. Throughout the Planning Area, Pleasanton stores its water in tank reservoirs which are grouped into four main pressure zones and a number of smaller pressure zones. The main water pressure zones consist of the Lower Zone (representing 80 percent of total demand) and three Upper Zones serving

Water tank above Foothill Road

[9] Camp Dresser & McKee, 2004.

portions of the Foothill Road area in the west (the Foothill Zone and the 770 Zone) and the Southeast Hills and Ruby Hill areas in the southeast (the Bonde Zone).

In order to meet the City's projected storage needs to the year 2025, the City will need additional water storage tank reservoirs in both the City's Lower and Upper Zones. The City plans additional Lower Zone storage adjacent to the City's Tassajara Reservoir that was constructed north of I-580 in 1993. The location of the additional Upper Zone storage will depend on the location of the new development. Exact sizes of these reservoirs and the timing of construction depend on future water-usage patterns and General Plan buildout projections.

Water Distribution System [10]

A system of pipes sized to deliver sufficient water volumes and pressure to service residential, commercial, and industrial users compose the City's water distribution system. Currently, the City's water system contains over 300 miles of water pipelines ranging from 4 to 36 inches in diameter. For planning purposes, new development must provide an average water pressure of not less than 40 pounds per square inch (psi) and no more than approximately 85 psi at the water-service meter. During peak-hour periods, pressure must be at least 30 psi, and during periods of major fire demands, pressure must be at least 20 psi. To service residential, commercial, and industrial customers, the City has located water pipes under most of its streets.

The City completed a *Water System Master Plan Update* in 2004. The update identified additional water pipes that require construction or improvement to meet the City's projected water use as well as the City's water quality and blending needs. The *Water System Master Plan* is already being implemented through the City's Capital Improvement Program and with new development projects.

In order to increase reliability, flexibility, and delivery of water service, both Zone 7 and the City have recently constructed or are designing a number of infrastructure improvements. These improvements include new wells, new turnouts, and new pipelines. In the past 10 years developers have constructed new water storage tanks for The Preserve, Moller Ranch, Ruby Hill, and Bridle Creek residential projects as well as residential development around the City's Callippe Preserve Golf Course. The Preserve tank will also serve several other smaller residential projects in the Dublin Canyon Road area. These facilities greatly improve the safety and reliability of this system and bring this area into compliance with the City's *Water System Master Plan* standards. The new Lund and Golf Course Tanks constructed as part of the Bridle Creek and Callippe Preserve Golf Course development in the southeast portion of the city will aid in overall City storage and are designed to serve both existing and planned residential development in the major portion of the Happy Valley Specific Plan area.

With further build-out of the Lower Zone, the existing excess storage will gradually diminish, until approximately 2010-2012 when the Lower Zone will require additional storage. Current projections indicate that proposed General Plan build out will require an additional 2-3 million gallons of storage. The City will provide additional storage in an expanded Tassajara Reservoir or in a separate storage reservoir at another location.

[10] Camp Dresser & McKee, 2004.

During normal year peak periods, Pleasanton can currently rely, in total, on a delivery or supply capacity of approximately 34.4 mgd through the current infrastructure system (25.4 mgd from Zone 7 and 9.0 mgd from the City's wells). Under normal water supply conditions, the City has sufficient water supply to deliver to its users. Recent planned improvements to the City and Zone 7's delivery system will ensure that ample water supplies meet maximum-day demands. Thus through at least 2012, the City can meet water demands in accordance with its *Water System Master Plan* standards without adding additional facilities. Depending upon the timing and location of demands, this date could be further in the future.

WASTEWATER

Wastewater facility planning involves a collection system (gravity pipelines, force mains, and sewage-lift or pumping stations), a treatment plant where raw sewage is treated to meet federal, State and regional standards, and an export or disposal system to transport the treated effluent to an approved discharge location. Three agencies handle the basic components (collection, treatment, and disposal) of sewer service within the city. Pleasanton provides its own sewage collection facilities within the City's limits. The Dublin-San Ramon Services District (DSRSD) provides sewage treatment services under contract with Pleasanton. The Livermore-Amador Valley Water Management Agency (LAVWMA) – a joint powers agency between Pleasanton, Livermore and DSRSD – provides export/treated sewage disposal services for treated sewage effluent.

The Regional Water Quality Control Board permits Pleasanton, Livermore, and the sewer service area of DSRSD to use the San Francisco Bay as the discharge point for treated wastewater. A discussion of Pleasanton's wastewater collection, treatment, and disposal facility program is presented below. Figure 8-6 shows the location of sewage treatment plants, pump stations, and the export system.

Dublin-San Ramon Service District

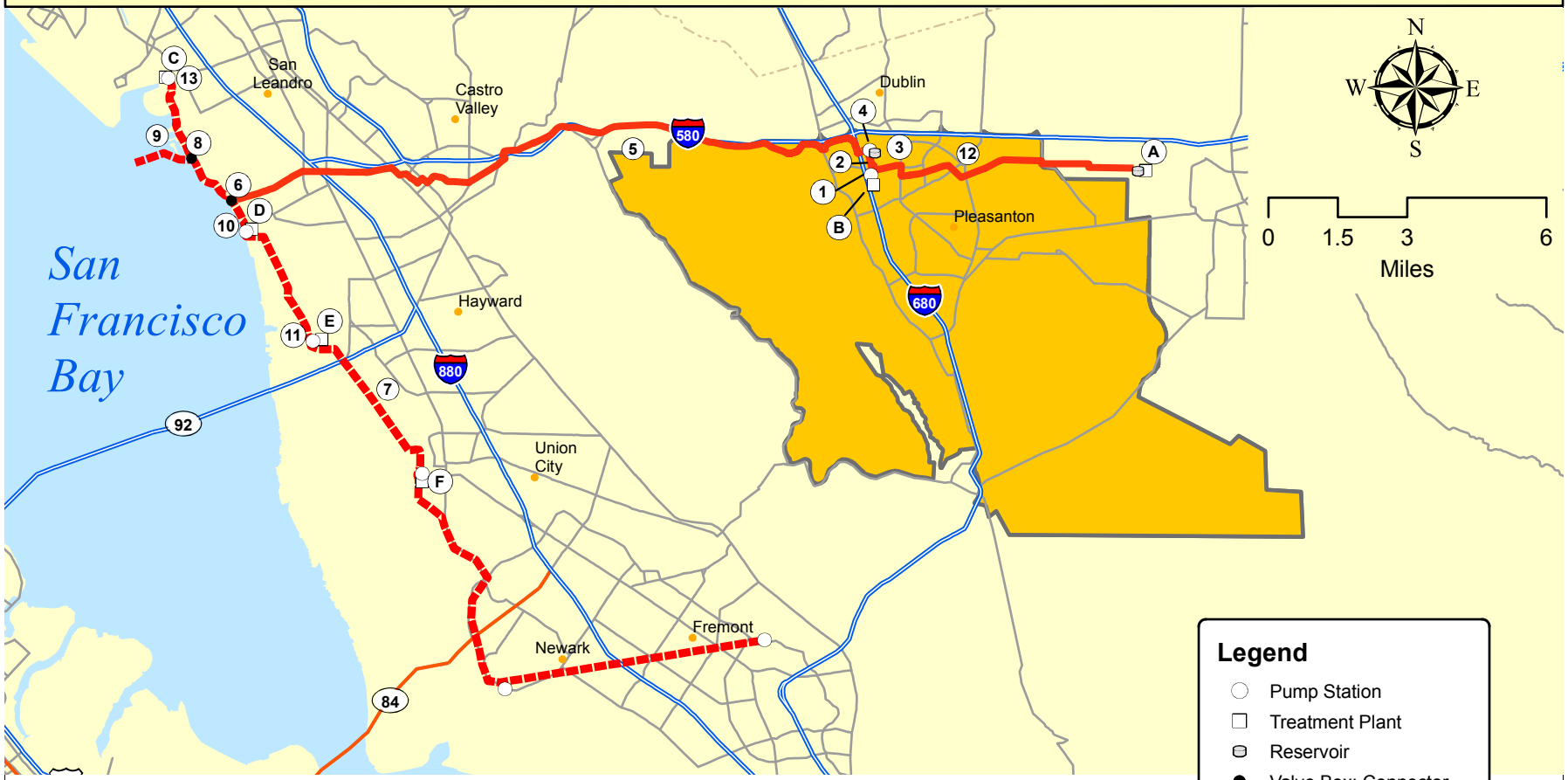
Dublin-San Ramon Services District Treatment Plant

Collection System

The City of Pleasanton owns, operates, and maintains a wastewater collection system within its boundaries. Total pipeline length within the service area exceeds 250 miles and consists of local and trunk sewer pipes ranging in size from four to forty-two inches in diameter. In addition to numerous sewer mains and collectors, four major trunk sewers are tributary to the wastewater treatment plant and the ten pump stations in the system.

Pleasanton's sewer flows include sewage from the Castlewood area, but do not include sewage from the Ruby Hill area. Under contract with the City of Pleasanton, the City of Livermore treats Ruby Hill wastewater flows.

2005 PLEASANTON PLAN 2025



Legend

1. DSRSD PUMP STATION
2. DSRSD INTERCEPTOR
3. LAVWMA REGULATING RESERVOIR
4. LAVWMA EXPORT PUMP STATION
5. LAVWMA EXPORT PIPELINE
6. CONNECTION TO EBDA INTERCEPTOR
7. EBDA INTERCEPTOR
8. MARINA VALVE BOX
9. EBDA OUTFALL
10. ORO LOMA / CASTRO VALLEY PUMP STATION
11. HAYWARD PUMP STATION
12. LIVERMORE INTERCEPTOR
13. SAN LEANDRO PUMP STATION

Treatment Plants

- A LIVERMORE
- B DSRSD
- C SAN LEANDRO
- D ORO LOMA / CASTRO VALLEY SANITARY DISTRICT
- E HAYWARD
- F ALVARADO-UNION SANITARY DISTRICT

THE CITY OF PLEASANTON

Source: DSRSD = Dublin / San Ramon Services District
LAVWMA = Livermore Amador Valley Wastewater Management Agency
EBDA = East Bay Dischargers Authority

Figure 8 - 6
Sewage Treatment and Export System

In order to determine appropriate collection system sizing, the City recently prepared a *Wastewater Collection System Master Plan* completed in mid 2006. This Plan has preliminarily identified facility capacities and improvements for build-out conditions of this General Plan.

By using winter water use data for existing parcels and uses within the city, the City determined the amount of wastewater generated by various land uses in the Planning Area. Based on preliminary results of the *Wastewater Collection System Master Plan,* the City's sewage collection system is adequate for current flows. The major trunk lines included in the City's past wastewater collection system master plan are in place and are sized appropriately to accommodate existing flows. However, based upon continued development in accordance with this General Plan, the City has identified the need for some improvements to the existing collection and pumping system. These improvements include construction of new or parallel sewers; diversion structures; and modifications, improvements, or complete reconstruction of various pump stations. These improvements do not include in-tract sewers or pipelines smaller than 10 inches in diameter in residential or commercial developments, for which individual project developers will pay.

The City's Capital Improvement Program includes projects designed to maintain the existing system and improve the performance of individual sub-components. With respect to the construction of new sewer main lines, this construction will be funded and constructed by new development as it occurs.

Treatment Plant

The Dublin-San Ramon Services District provides wastewater treatment services to the City of Pleasanton under a number of wastewater treatment and disposal contracts between the two agencies. The District owned and operated wastewater treatment plant is located immediately southeast of the I-680 / Stoneridge Drive interchange (see Figure 8-6, above). It provides both primary-, secondary-, and some tertiary-treated wastewater (which is utilized for irrigation purposes in the Dublin and San Ramon areas).

At the wastewater treatment plant, wastewater first passes through screens which remove large objects such as rags, sticks, and cans. It then passes through a grit chamber where sand, grit, and small stones settle prior to removal. The wastewater then moves to sedimentation tanks where most of the remaining solids settle to the bottom as raw sludge. Treatment then entails removing sludge and setting it aside for further treatment. This first phase of sewage treatment is called the "primary treatment" stage (see Figure 8-7, Sewage Treatment Process).

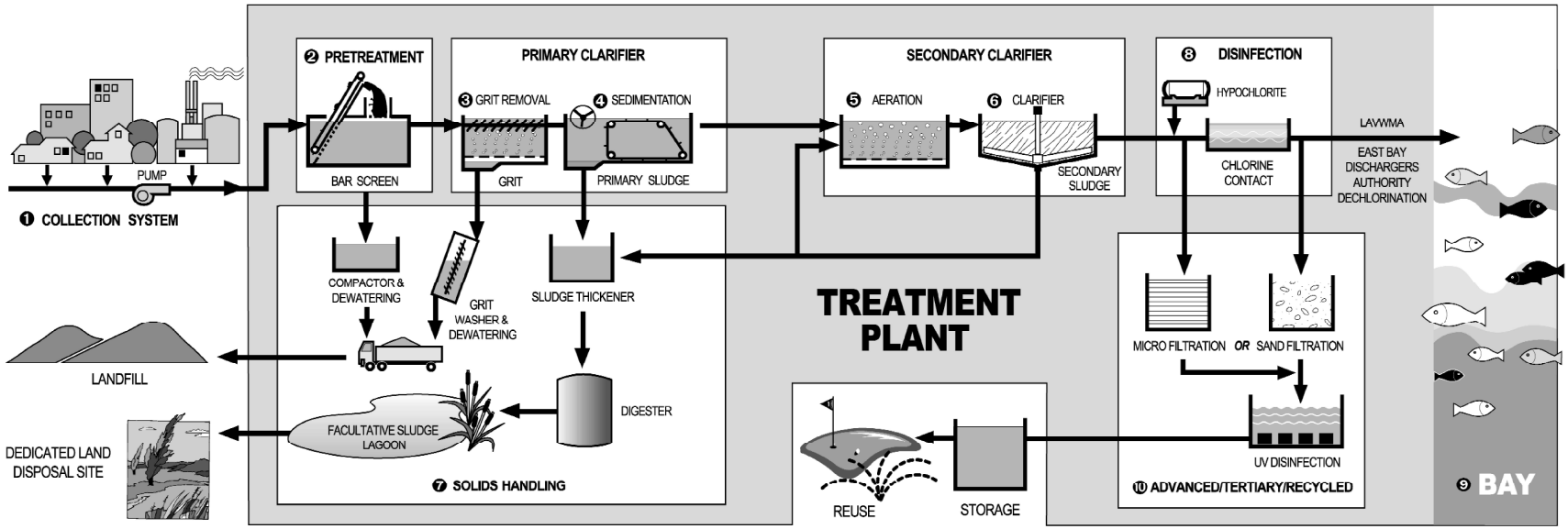
Secondary treatment takes the effluent from the sedimentation tanks and transfers it to an aeration tank where it is mixed with air and bacteria-infested sludge to further break down the organic matter. After several hours, bacteria activate the sludge, which can be used again, in the aeration tank where it is mixed with new sewage and air.

Following settling and chlorination, the treatment plant discharges the resulting water into the Livermore-Amador Valley Water Management Agency (LAVWMA) pipeline.[11] This pipeline transports wastewater to the East Bay Discharge Authority facility. This facility de-chlorinates and then discharges the wastewater into the outfall system to San Francisco Bay.[12] The treatment plant does not discharge all water into the pipeline, but uses a portion – after it undergoes additional tertiary treatment – for irrigation in non- residential landscape areas, and parks.

[11] http://www.dsrsd.com/construction_projects_section/lavwma.html, Dublin San Ramon Services District Website, 11/21/05.

[12] http://lavwma.com/Facilities/Lavwma_System.php, Livermore-Amador Valley Water Management Agency website, 11/21/05.

2005 PLEASANTON PLAN 2025



THE CITY OF PLEASANTON

Source: DSRSD

Figure 8-7
Sewage Treatment Process

The existing sewage treatment facility recently completed an expansion project to bring the average dry-weather wastewater-flow design capacity from 11.5 million gallons per day (mgd) of wastewater treatment capacity to 17 mgd.[13] The City of Pleasanton is currently entitled to half of this amount, or 8.5 mgd of the sewage treatment plant's capacity. The city's average annual wastewater flow is approximately 6.0 mgd. The current 8.5 mgd wastewater treatment capacity is sufficient to serve Pleasanton's planned buildout growth as anticipated in this General Plan.

Dublin-San Ramon Service District

Livermore-Amador Valley Water Management Agency wastewater pond

The maximum treatment plant ultimate design capacity is currently planned for 20.7 mgd average dry-weather flow in conformance with the Livermore-Amador Valley Water Management Agency Joint Powers Agency 1997 influent limits. Flows at the treatment plant are not expected to reach 17.0 mgd until around 2015. The Dublin-San Ramon Services District has not begun expansion planning for the increase from 17.0 mgd to the maximum 20.7 mgd. This future expansion will allow Pleasanton dry-weather flows to reach, but not to exceed, 10.3 mgd, if needed. The sewer district designed the existing sewage treatment plant to meet this expansion at its current site.

Export System

The Livermore-Amador Valley Water Management Agency – a joint powers agency comprised of the Dublin-San Ramon Services District and the Cities of Livermore and Pleasanton – owns and manages the current wastewater export system. The facilities consist of storage/flow equalization reservoirs, a large pumping station, and a pipeline to convey the treated wastewater across the Dublin Grade. The wastewater pipeline traverses I-580 as it extends westerly to the San Francisco Bay. The pipeline then connects with the East Bay Dischargers

Authority's interceptor and outfall system for discharging treated wastewater to the deep San Francisco Bay waters. The existing wastewater-discharge facilities are designed to pump not only the base dry-weather flows of the three member agencies, but also the wet-weather, or rain-dependent flows that enter each of the sewer-collection systems. The export discharge system operated at capacity during the heavy winter of 1996-97 and again in 1997-98. These peak flows required the system to operate at capacity while using all available storage.

In November 1998, Pleasanton voters approved *Measure U* which allows Pleasanton to expand its capacity in the Livermore-Amador Valley Water Management Agency system. The expansion project has now been completed, and has a combined wet weather export capacity of 41.2 million gallons per day (mgd). Pleasanton, the

[13] Brown and Caldwell, Dublin San Ramon Services District Wastewater Treatment Plant Master Plan, January 1984.


Livermore-Amador Valley Water Management Agency

Installing the LAVWMA Pipeline

Dublin-San Ramon Services District, and Livermore plan to share the allocated expansion increment (20.2 mgd) among them, with Pleasanton acquiring an additional 6.9 mgd of capacity and thereby increasing its total wastewater wet-weather discharge capacity to 14.4 mgd, sufficient to accommodate buildout of this General Plan.

Wastewater Summary

As existing and approved projects develop, sewage effluent will increase. Pleasanton has entered into numerous sewage reservation agreements that guarantee capacity to various properties/projects. Most approved, but un-built, commercial/office development utilizes capacity Pleasanton has "reserved" for it out of its original sewage treatment-plant and wastewater discharge capacities.

Because Pleasanton has secured both treatment plant and export capacity by agreement with the Dublin-San Ramon Services District and its participation in the Livermore-Amador Valley Water Management Agency Expansion Project, sewage treatment and disposal capacity is not a constraint in the short- or mid-term. The City's current treatment and disposal capacities are adequate for growth anticipated to occur between 2005 and 2025.

Pleasanton has secured capacity for its continued existing and future wastewater flows. In addition, Pleasanton's capacity in the discharge pipeline will allow growth in dry-weather flows as well as accommodate its wet-weather flows for many future years. Table 8-2 shows 2005 and 2025 sewage discharge totals.

STORMWATER

Background Information

Historically, the Amador Valley has experienced relatively frequent and substantial flooding because many streams which drain large areas of impermeable soils converge in the area. During periods of intense rainfall, runoff rapidly causes stream flows to exceed floodway capacities and inundate adjacent areas of the flat valley floor. Extensive flood channel improvements required of development projects during the past 20 years have significantly reduced this type of flood hazard. As a result of good planning and system maintenance, the Tri-Valley now experiences minimal flood damage compared with other areas of California.

Flood-producing rainfall occurs during the winter months in the Pleasanton area. Storm runoff is concentrated rapidly by the network of tributaries through the hills which discharge into Arroyo Mocho, Arroyo del Valle, and other tributaries to the Arroyo de la Laguna. The tributaries have carved well-defined courses through the hills but upon reaching the flat valley, the channels become shallow and inadequate for more frequent and higher capacity flows. The main flooding problem is currently caused by the low capacity of the lower reaches of Arroyo de la Laguna, which causes backwater flooding in its tributary channels.

TABLE 8-2: PLEASANTON'S ANNUAL WASTEWATER DISCHARGE, 2005 AND 2025

	Gallons/day	100 cu ft/year [a]
2005 TOTAL [b]	6,250,000	3,049,799
2025 TOTAL [d]	8,261,706	4,031,447
Single-Family Residential	5,381,235	2,625,870
Multi-Family Residential	709,465	346,196
Commercial and Institutional [c]	1,940,166	946,739
Industrial	199,749	97,471
Parks	31,091	15,171

Notes:

a cu ft = cubic feet , 100 cu ft = 748 gallons

b 2005 totals are based on actual discharge.

c Commercial includes office and retail uses. Institutional includes government offices, medical offices and hospitals, and schools.

d Note that sewage discharge is substantially less than water demand (Table 8-1, page 8-11) because most water used for landscaping and parks is not discharged into the wastewater system. The totals are estimated. For 2025, this table assumes that about 55% of single-family residential (including condominiums and townhouses), 65% of multi-family residential, 75% of commercial, institutional, and industrial water along with 3% of park water used is discharged to the waste stream. No landscape irrigation would be discharged into the waste stream.

Sources: City of Pleasanton Public Works Dept., Operations Service Center; and Planning & Community Development Dept., 2008.

When substantial rainfall does occur, the runoff is rapid and heavy, causing stream-flows to exceed the normal stream courses' capacities and inundating large areas of the flat valley floor. Flooding is not limited to occasions of intense precipitation, however. Flooding may occur following low-intensity precipitation spread over several days, as occurred in storms of 1955 and 1958.

Stormwater Drainage

The local storm drainage system consists of underground pipes, local channels, and natural swales in hillside areas. These facilities carry water runoff within the drainage basin to the flood-control channels (known locally as arroyos). Developers of new projects must install adequately-sized storm drains to connect to the City's existing underground storm drain network. The City requires that hillside projects protect natural drainage courses and install silt basins / retention ponds for controlling pollutants and the runoff-flow rate. The City has required new developments to size their storm drains to accommodate major rainfalls.

To accommodate future buildout of the Planning Area, the City will continue to require that new developments install appropriately-sized storm drains. As identified and budgeted in the City's Capital Improvement Program, the City has scheduled improvements in periodic increments to older portions of the storm drain network.

Flood Protection

Responsibility for flood protection within the Planning area lies with Zone 7 of the Alameda County Flood Control and Water Conservation District. Zone 7 maintains improved flood-control channels and installs new drainage channels. Under Zone 7 permits, development projects have improved most of these channels, the arroyos, over the last 20 years. The unchannelized Arroyo de la Laguna, south of Bernal Avenue, remains a distinct riparian corridor. Improvements to this portion of the Arroyo de la Laguna should be designed to retain the existing riparian flora and fauna to the maximum extent possible.

In the future, the City will continue to cooperate with Zone 7 to improve and maintain the flood-control system. Zone 7's *Stream Management Master Plan* includes improvements required as full

construction/development of the Pleasanton Planning Area proceeds.[14] Figure 8-8 shows surface water and flood-control facilities.

As a result of the 100-year storm event, the potential exists for significant flooding in Pleasanton. Zone 7 predicts that in the future all arroyos in Pleasanton will overtop during a 100-year flood event, and Zone 7 thus continues to educate the public about this potential flooding. Flooding could be aggravated by several problems. First, sediment accumulates in the arroyos and reduces their capacity. Second, removing sediment has the potential for disturbing established wetland habitat. Finally, expanding the size of existing channels would cause significant biological effects. In response to these problems, Zone 7 will divert peak flows from Arroyo las Positas and Arroyo Mocho to the Chain of Lakes and will, where possible, remove excess arroyo sediment. [15]

Alameda County developed the "chain of lakes" concept in the 1970s. The Chain of Lakes are located between the cities of Livermore and Pleasanton and, when complete, will consist of a series of abandoned gravel quarry pits converted into nine lakes, linked in a series, plus Cope Lake.[16] Thus far the County owns two of these lakes, and will acquire one around 2014 and two more by 2030. The lakes are used for seasonal waterstorage and conveyance, and floodwater detention. Figure 8-8 also shows existing and planned stormwater storage at the Chain of Lakes.

Water levels are maintained at these lakes so that stored water can percolate through the sides of the lakes (except for Cope Lake) and help recharge the groundwater basin. The other lakes will be available for stormwater storage and groundwater recharge in the next 10 to 30 years after they have been mined and reclaimed.

The City of Pleasanton supports public awareness flood-control programs sponsored by the Federal Emergency Management Agency (FEMA) and desires to increase public awareness about flooding.

Zone 7 Water Agency

Lake I inflow, Chain of Lakes

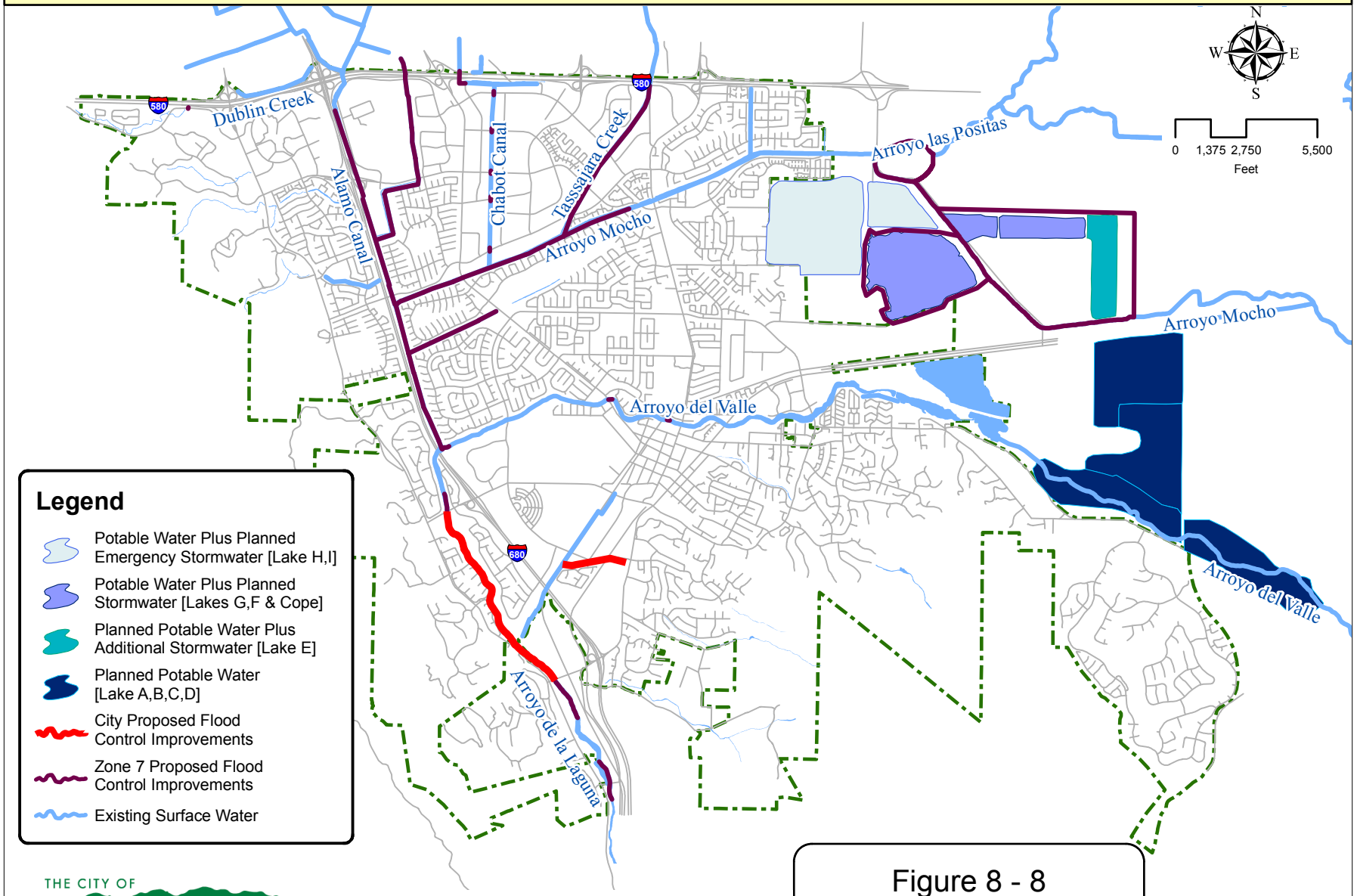
These programs provide valuable educational information to the general public about flood zones and flood insurance requirements. The City has had no reoccurring flood losses during the past ten years and FEMA's Community Rating System currently rates Pleasanton "8," with a "1" being the best rating and "10" the worst rating. Pleasanton's rating qualifies its residents for a 10 percent discount on

[14] Zone 7, Alameda County Flood Control and Water Conservation District, *Stream Management Master Plan,* adopted

[15] *Ibid.*

[16] Matthew Katen, Registered Geologist, and Certified Hydrogeologist, and Carol D. Mahoney, Registered Geologist, Alameda County Flood Control and Water Conservation District, Zone 7, and James. F. Reilly, Professional Engineer, Stetson Engineers, Inc., "Case Study: Chain-of Lakes Project, Alameda County, California," paper presented at the 11th Biennial Symposium of the Groundwater Recharge, Phoenix, AZ, June 5-7, 2003.

2005 PLEASANTON PLAN 2025



THE CITY OF PLEASANTON

Source: Zone 7 Water Agency, Stream Management Master Plan, March 2006
City of Pleasanton, Community Development Department, 2008

Figure 8 - 8
Surface Water and Flood-Control Facilities

flood-insurance premiums and is an improvement over the City's previous rating of "9." [17] It is the City's goal to maintain or improve this rating so as not to increase insurance rates or safety risks for Pleasanton flood-plain-area residents. (See also Public Safety Element, Flood Hazards.)

Stormwater Management

Historically, the City has focused stormwater runoff management efforts on reducing downstream flooding risks by providing storm drain systems in developed areas. However, stormwater runoff also carries urban pollutants, which create water-quality problems in downstream water bodies and which, in turn, impact aquatic life and the overall ecosystem health.

Because the *Federal Clean Water Act* requires municipalities to implement stormwater management programs, the City prepared the Phase I Storm Water Program in 1989 and Phase II program in 2001. To protect water quality, municipalities – under newly established rules – must obtain a National Pollution Discharge Elimination System (NPDES) permit for developing and implementing a stormwater management program. The stormwater management program must include the following control measures for reducing the quantity of pollutants that stormwater picks up and carries into the stormwater system: Public Education and Outreach, Public Participation/Involvement, Illicit Discharge Detection and Elimination, Construction Site Runoff Control, Post-Construction Runoff Control, and Pollution Prevention / Good Housekeeping. These control-measure programs target reducing stormwater pollution in storm drain systems and creeks, which eventually flow into water bodies including the San Francisco Bay.

Storm water on property in Bernal Specific Plan Area

To implement Phase I and II rules under the *Clean Water Act,* Alameda County established a county-wide water program to guide cities in establishing control measure programs. The City of Pleasanton actively participates in this program and has joined other Bay Area communities in implementing the clean water runoff permit provisions.

The City recognizes that new stormwater-quality controls and development requirements may add cost to development projects and business operations. Therefore, as development occurs, Pleasanton is attempting to balance the objectives of meeting clean-water program mandates utilizing biological methods – such as vegetated swales and bio-retention ponds – along with encouraging economic development and business retention.

[17] http://www.fema.gov/nfip/crs.shtm, FEMA (Federal Emergency Management Agency), updated October 21, 2005.

RELATIONSHIP TO OTHER ELEMENTS

Policies and programs established throughout the General Plan affect water in Pleasanton.

Land Use Element

The Land Use Element references Water Management and Recreation in the Chain of Lakes area, as well as other open space designations that contain open creeks and waterways. The Water Element further discusses this land-use designation.

Public Safety Element

The Public Safety Element discusses flood hazards, including those from dam failure inundation. The Water Element discusses stormwater drainage, flood control, and stormwater management, all of which are related to flood hazards.

Public Facilities and Community Programs Element

The Public Facilities Element defines recreational facilities and programs needed to service the community. The Water Element references some water-related recreational areas including Shadow Cliffs and future uses at the Chain of Lakes.

Conservation and Open Space Element

The Conservation and Open Space Element discusses conservation of all natural resources except for water. The Water Element discusses conservation of water-based natural resources, including stormwater runoff. Under Plant Life, the Conservation and Open Space Element discusses wetlands and riparian corridors, while under Soil Resources it discusses soil types for groundwater recharge, and under Sand Gravel Resources it also addresses the Chain of Lakes, which the Water Element discusses in greater detail. Finally, under Open Space Lands, that Element discusses Water Management and Recreation, a type of open space. The Conservation and Open Space Element emphasizes open-space uses and recreation in the context of natural areas, including the new Water Management and Recreation type of open space. The Water Element references some water-related recreational areas, including Shadow Cliffs and future uses at the Chain of Lakes.

Air Quality and Climate Change Element

The Air Quality Element discusses how some criteria air pollutants could impact wildlife and habitats. The Water Element briefly discusses wildlife and habitats.

Noise Element

The Noise Element discusses existing and future noise levels in Pleasanton. Noise levels could impact public enjoyment of outdoor recreational water resources.

Community Character Element

The Community Character Element addresses many of the facilities and programs in Pleasanton that make up its community character, including its arroyos, canals, and recreational areas The Water Element also addresses these issues as they relate to water resources.

Subregional Planning

The Subregional Planning Element discusses water resources, water supply, and wastewater in the Tri-Valley Area. The Water Element also discusses these resources and issues as they relate to Pleasanton, as well as to the Tri-Valley.

GOALS, POLICIES, AND PROGRAMS

Goal 1: Preserve and protect water resources and supply for long-term sustainability.

Policy 1 To ensure sustainability, promote the conservation of water resources.

Program 1.1: Prohibit water supply production policies and practices which would deplete groundwater resources below existing sustainable levels.

Program 1.2: Foster water conservation practices which do not allow depletion of groundwater and surface water resources to the extent that they cannot be replaced within the same water season.

Program 1.3: Support Zone 7 Water Agency in water supply production, treatment, and procurement practices that do not negatively impact the environment.

Program 1.4: Work with Zone 7 Water Agency to investigate innovative and more efficient ways to recharge aquifers and other groundwater resources.

Program 1.5: Utilize cost-effective water reclamation and recycling techniques for the purpose of water conservation rather than as a new source of water which must be used to sustain new and existing development, where these techniques can be implemented without degrading surface water and groundwater quality.

Program 1.6: Investigate the feasibility of using stormwater runoff, if all water quality measures are in place, for irrigation and groundwater recharge.

Program 1.7: Require the installation of water conservation devices in new construction and additions.

Program 1.8: Encourage Zone 7 to continue its on-going citywide rebate program for water-conserving fixtures and appliances.

Program 1.9: Continue to demonstrate low water-use techniques at community garden and City-owned facilities.

Program 1.10: During construction or reconstruction of public facilities, institute water conservation measures such as hot-on-demand water faucets, low-flush toilets, low water-using appliances, and low water-using irrigation devices and/or water-conserving landscaping.

Program 1.11: Retrofit existing public facilities, as feasible, to institute water conservation measures.

Program 1.12: Compile a list of recommended landscaping species, including trees, that are native and drought tolerant. Include discussion of any wildlife habitat values of these species. Compile a list of noxious and invasive species and educate the public about their disadvantages. Distribute these lists to the public and make them available at the Planning and Building offices, as well as at the Library.

Program 1.13: Plant drought-tolerant landscaping in appropriate locations. All landscaping aspects from plant selection to irrigation methods should be designed to reduce water demand, decrease runoff, and minimize impervious surfaces.

Program 1.14: Undertake programs to educate citizens about water conservation in the home and in landscaping.

Green construction practices from the Energy Element will reduce environmental impacts of construction activity, including on water resources and/or due to stormwater runoff.

Water Resources

Goal 2: Provide healthy water courses, riparian functions, and wetlands for humans, wildlife, and plants.

Policy 2: Preserve and enhance streambeds and channels in a natural state.

Program 2.1: Develop and implement ordinances and policies that provide for the preservation and restoration of riparian functions, and establish mitigation requirements for modifications to riparian corridors.

Program 2.2: Develop policies and standards in cooperation with Zone 7 that include restoring riparian corridors when flood- and erosion-control activities require channelization.

Program 2.3: Utilize habitat preservation and reclamation measures when designing flood- and erosion-control projects to limit impacts on plants and wildlife.

Program 2.4: Design projects adjacent to the arroyos to protect habitat areas.

Program 2.5: Work with Zone 7 Water Agency to restore arroyos consistent with its Stream Management Master Plan.

Program 2.6: Work with Zone 7 Water Agency to provide information to the public regarding the importance of healthy arroyos.

Program 2.7: Locate wetland buffers between a wetland and proposed, existing, or potential development. These buffers should be of sufficient width and size to protect species most sensitive to development and should be designed to complement the habitat value of the wetland resource.

Program 2.8: Require that future developments result in no net loss of wetlands.

Also implement wetlands Program 1.3 from the Conservation and Open Space Element.

Water Quality

Goal 3 Ensure a high level of water quality and quantity at a reasonable cost, and improve water quality through production and conservation practices which do not negatively impact the environment.

Policy 3:	Protect the quality and quantity of surface water and groundwater resources in the Planning Area.

Program 3.1: Do not utilize water reclamation techniques, including reverse osmosis, which could adversely affect or have potentially negative impacts on drinking water quality, surface waters, or groundwater resources.

Program 3.2: Work with Zone 7 to monitor water-quality levels and test for pollution, including diazinon, of arroyos and aquifers to ensure that Pleasanton's drinking water is not contaminated with pollutants.

Program 3.3: Continue to monitor water quality in existing business park monitoring wells.

Program 3.4: To preserve areas with prime percolation capabilities, regulate projects that use toxic chemicals including herbicides in water recharge areas, such as adjacent to arroyos.

Program 3.5: Coordinate with Zone 7 to control pollutant discharges and increase public education regarding the use of pesticides, such as diazinon, and the use of herbicides.

Program 3.6: Prohibit new septic systems, automobile dismantlers, waste disposal facilities, industries utilizing toxic chemicals, and other potentially polluting uses in areas where pollution could impact flood waters, groundwater, streams, creeks, or reservoirs.

Program 3.7: To the extent compatible with the goal of maintaining water quality and public safety, retain water recharge areas, if feasible, as permanent open space accessible to the public.

Program 3.8: Coordinate with the Dublin-San Ramon Services District to investigate cost-effective sewage treatment and disposal methods that utilize reclaimed wastewater for productive use and that protect the quality of the groundwater supply.

Program 3.9: Support the policies and programs contained in the Water Quality Control Plan for the San Francisco Bay Basin to the extent they are consistent with the City's policies for water quality.

Program 3.10: Protect watershed lands in Southern Pleasanton south of Castlewood Drive for purposes of water quality, flood control, and biological diversity.

Program 3.11: Support Zone 7 in implementing its Stream Management Master Plan so as to protect and enhance the water quality of streams and groundwater.

Program 3.12: Conserve Pleasanton's urban forest, including trees in parks and on private property as well as street trees, so as to continue and enhance surface water filtration and community character. Pervious ground surfaces and the trees' root systems help in the filtration of surface water below the ground level.

Also implement Programs from the Community Character Element to replace and protect street trees.

Water Systems

Goal 4: Provide sufficient water supply and promote water safety and security.

Policy 4: Ensure an adequate water system and a high quality water supply for existing and future development, and maintain an adequate reserve of water in storage facilities.

Program 4.1: Require new development to pay for its fair share of the City's water system master plan improvements.

Program 4.2: Develop a contingency plan for potential water shortages including groundwater management and water conservation.

Program 4.3: Work with Zone 7 to establish and monitor acceptable ranges of underground water levels and recharge when necessary.

Program 4.4: Maintain sufficient water pressure to serve residential, commercial, industrial, and fire-flow requirements as determined by the City Engineer.

Program 4.5: Utilize water reclamation methods to the fullest extent feasible, where safe and nonpolluting.

Program 4.6: Work with Zone 7 to develop contingency plans for supplemental water sources independent of the State Water Project.

Program 4.7: Evaluate water supply as part of the Growth Management Report.

Program 4.8 Work with Zone 7 to implement water facility upgrades to improve water taste and to decrease water hardness.

Program 4.9: In anticipation of planned future growth in Pleasanton, continue working with Zone 7 to plan and provide for sufficient future water supplies.

Program 4.10: Continue to work with Zone 7 to ensure that use of the groundwater basin by Zone 7 does not result in deterioration of water quality.

Program 4.11: Encourage water retailers to continue to work with Zone 7 on water conservation and quality issues.

Program 4.12: Work with Zone 7 to secure water facilities against sabotage.

Program 4.13: Work with Zone 7 to develop water conservation plans and strategies for the long term.

Wastewater

Goal 5: Provide adequate sewage treatment and minimize wastewater export.

Policy 5: Secure sewage capacity through all available means for residential, commercial, and industrial development.

Program 5.1: Require new development to pay its fair share of the City's planned sewer system improvements including treatment, distribution, reuse, and export facilities.

Policy 6:	Approve only those sewage collection, treatment, and export expansion alternatives which are cost- and energy-efficient and do not create a health hazard.

Program 6.1: Utilize wastewater reuse/reclamation methods to the fullest extent financially and environmentally feasible. Identify additional parks, playgrounds, and non-residential landscaping where recycled tertiary-treated wastewater could be used without negatively impacting groundwater (e.g., with salt buildup). Encourage new parks and non- residential landscaped areas to use recycled wastewater whenever feasible, safe, cost-effective, and nonpolluting. Encourage new and retrofitted commercial uses to utilize recycled wastewater for landscaping and toilets, whenever feasible, safe and nonpolluting.

Policy 7:	Support cost-effective and environmentally sensitive approaches to wastewater reuse in the Tri-Valley.

Program 7.1 Work with Zone 7 and other water, wastewater, business, and planning agencies to support cost-effective and environmentally sensitive approaches to Tri-Valley wastewater reuse.

Stormwater Facilities

Goal 6:	Minimize stormwater runoff and provide adequate stormwater facilities to protect property from flooding.

Policy 8:	Ensure an adequate storm drainage system to serve existing and future development.

Program 8.1: Require new development to pay its fair share of the storm drainage system improvement costs.

Program 8.2: Design local storm drainage improvements to carry appropriate design-year flows resulting from buildout of the General Plan.

Program 8.3: Work with Zone 7 to complete planned, regional storm drainage improvements.

Program 8.4: As determined by the City Engineer, require new development to improve local storm drainage systems to accept appropriate design-year flows resulting from new development.

Policy 9:	Ensure a sufficient flood-control system to serve existing and future development

Program 9.1: Require new development to pay its fair share of the flood-control improvement costs included in Zone 7's Master Plan.

Program 9.2 Design flood water detention basins and arroyos to allow for public amenities, recreation, natural habitat, and agriculture, where feasible.

Program 9.3: Support Zone 7's plan to establish the Chain of Lakes for flood control, water supply, and recreation. Include a public awareness program about the need for the Chain-of-Lakes resource.

Goal 7: Reduce stormwater runoff and maximize infiltration of naturally-occurring rainwater so as to improve surface and subsurface water quality.

Policy 10: Encourage a built environment that minimizes impervious surfaces.

Program 10.1: Review development plans to minimize impervious surfaces and generally maximize infiltration of rainwater in soils, where appropriate. Maximize permeable areas to allow more percolation of runoff into the ground through such means as biofilters, green strips, planter strips, decomposed granite, porous pavers, swales, and other water-permeable surfaces. Require planter strips between the street and the sidewalk within the community, wherever practical and feasible.

Program 10.2: Maximize the runoff directed to permeable areas or to stormwater storage by (1) orienting roof runoff towards permeable surfaces or drains, (2) grading the site to divert flow to permeable areas, (3) using cisterns, retention structures, or green rooftops to store precipitation for reuse, and (4) designing curbs and berms so as to avoid isolating permeable or landscaped areas.

Program 10.3: Encourage design and construction of new streets to be the minimum width possible while still meeting all circulation, flow, and safety requirements. Encourage parking pullouts adjacent to landscaping and pervious surfaces, where practical and feasible.

Program 10.4: Consider reducing parking ratios for transit-oriented and mixed-use development.

Program 10.5: Discourage additional parking over and above required minimum parking standards for any land use, unless the developer can demonstrate a need for additional parking.

Program 10.6: Encourage multi-story parking garages when practical to limit the land area covered by parking.

Program 10.7: Create a vegetative buffer between streambeds and development. Developers should retain existing vegetation and, where necessary, plant these buffers with native plant species.

Policy 11: Implement stormwater runoff requirements, as required by the State Regional Water Quality Control Board and the Alameda County-wide Clean Water Program, with as little impact on development and business costs as possible.

Program 11.1: Incorporate conditions of approval developed by the Alameda County-wide Clean Water Program, as appropriate, for new development and discretionary permits.

Program 11.2: Develop design guidelines and standard details to enable developers to incorporate clean water runoff requirements into their projects.

Program 11.3: Using the *California Environmental Quality Act* (CEQA) process, evaluate the development effects on stormwater runoff.

Program 11.4: Encourage site planning and design techniques to minimize water-quality impacts, including minimizing land disturbance, minimizing impervious surfaces, clustering development, preserving open space, and maintaining riparian areas with buffer zones to reduce runoff into waterways.

Program 11.5: Include stormwater quality requirements in plans and contract specifications for City projects.

Program 11.6: Require use of Best Management Practices for construction activities and ongoing business operations to prevent contaminants from entering the storm drain system.

Program 11.7: Review the City's erosion and sedimentation prevention program to ensure that erosion prevention controls and enforcement are being implemented. Create an ordinance, if necessary, to accomplish these requirements.

Program 11.8: To effectively prohibit non-stormwater discharges, conduct construction site field inspections to ensure proper erosion prevention and materials/waste management implementation.

Program 11.9: Provide educational materials for distribution to developers, businesses, and the general public explaining stormwater-quality issues and requirements, and Best Management Practices to help improve stormwater quality.

Program 11.10: Train City staff on stormwater quality requirements with an emphasis on being proactive and effective in implementing stormwater controls.

Program 11.11: Minimize sedimentation and erosion by establishing standards for evaluating and implementing grading, quarrying, tree cutting, vegetation removal, road and bridge placement, off-road vehicle use, and domesticated animal-related soil disturbance controls.

Program 11.12: Maintain and monitor storm-drainage water quality improvement facilities.